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Deglaciation history of the East Antarctic Ice sheet revealed by exposure ages and marine sedimentary records in Lützow-Holm Bay, Dronning Maud Land

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The East Antarctic Ice Sheet (EAIS) is one of the most significant potential contributors to future sea-level changes. The inflow of modified Circumpolar Deep Water (mCDW) has been focused as one of the major causes of the thinning and mass loss of the Antarctic Ice Sheet. However, the role of the mCDW for the large-scale deglaciation of the EAIS, such as the deglaciation since the Last Glacial Maximum (LGM), remains unclear due to the lack of the geological data. Therefore, highly-resolved reconstruction of the deglaciation history of the EAIS since the LGM is essential to understand the role of the mCDW, which will be a useful analog for calibrate the climate and ice sheet models and refine the future ice sheet retreat projection. In this presentation, we show an overview of our recent activities in the Dronning Maud Land, East Antarctica (e.g., Kawamata et al., 2020; Ishiwa et al., 2020). Newly obtained surface exposure ages and sedimentary Be-10 records coupled with the previously reported benthic foraminiferal assemblage from Syowa Oasis and Lützow-Holm Bay show a rapid thinning of the EAIS during the early-mid Holocene potentially due to an inflow of mCDW. We, therefore, suggest that it will be a key to obtain both terrestrial and marine-based geological data from the Antarctic margin to understand the potential impact of ocean warming to the rapid and large scale ice sheet melting of the EAIS.

References

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